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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,999	03/23/2001	Stephen Christopher Kitson	30001064	2104

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Paul D. Greeley  
c/o Ohlandt, Greeley Ruggiero & Perle  
Suite 903  
One Landmark Square  
Stamford, CT 06901

EXAMINER

NGUYEN, HOAN C

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 06/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/815,999	KITSON ET AL.
	Examiner HOAN C. NGUYEN	Art Unit 2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on \_\_\_\_.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-19 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_ is/are allowed.  
 6) Claim(s) 1-19 is/are rejected.  
 7) Claim(s) \_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 23 March 2001 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 11) The proposed drawing correction filed on \_\_\_\_ is: a) approved b) disapproved by the Examiner.  
 If approved, corrected drawings are required in reply to this Office action.  
 12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.  
 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
 a) The translation of the foreign language provisional application has been received.  
 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.

4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_.

## DETAILED ACTION

### ***Response to Amendment***

In Remark, applicants have specified

- a “feature” referring to as an “alignment domain” (page 5 lines 1-3);
- pseudorandom array with a repeat distance of 56 $\mu$ m, much greater than wavelength of visible light (page 5 paragraph 3 line 8-9).

Applicant's amendment filed on 4/12/2002 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

New limitation is added in new independent claims: "the said surface alignment structure comprises one of random or pseudorandom two dimensional array of upstanding feature" in specific orders for improving the reflective electrode performance. The rejections of dependent claims will use the same old references. Therefore, new grounds of rejection have been made in this FINAL office action as follows:

***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show features of "a method of manufacturing of cell wall" in claims 13, 14 and 17 as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 2, 4-7, 9, 12, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US6067141A).

In regard to claims 1, 12 and 18, Yamada et al. disclose (prior art Fig. 12A-B) a liquid crystal device comprising:

- a first cell wall 102 and a second cell wall 101 enclosing a layer liquid crystal material 107;
- electrodes 103 for applying an electric field across at least some of the liquid crystal material;
- a surface alignment structure (domains 110 a-c) on inner surface of at least the first cell wall providing a desired alignment to molecules of the liquid crystal material,

wherein the surface alignment structure comprises one of a random two dimensional array (Fig. 12B) of upstanding features, which are at least one of shaped and orientated to produce the desired alignment. As remark's applicant, "features are not pixels or liquid crystal molecules, although a grouping of the features could be referred to as an alignment domain" (page 5 lines 1-3), thus "upstanding features" are referred to as an "upstanding alignment domain" as shown in Figs. 10 and 12B.

In regard to claims 2, 6-7 and 19, Yamada et al. disclose (prior art Fig. 12A-B) a liquid crystal device, wherein the geometry and spacing of features is such as to cause the liquid crystal material to adopt at least one of a locally planar alignment of the liquid crystal director in a single azimuthal direction as Fig. 12B shown or in a plurality of azimuthal directions as Fig. 10 shown.

In regard to claim 4, Yamada et al. disclose (Fig. 12A) a liquid crystal device wherein the inner surface of second cell wall is treated to produce at least one of a

locally planar alignment of the liquid crystal material substantially at right angles to the alignment direction on the first cell wall, whereby the cell functions in a TN mode.

In regard to claims 5 and 18, Yamada et al. disclose (Fig. 3) a liquid crystal device wherein the geometry and spacing of features is such as to cause the liquid crystal material to adopt at least one of a locally homeotropic alignment.

In regard to claim 9, Yamada et al. disclose (Fig. 12A) a liquid crystal device further comprising an analyzer/polarizer 106 mounted on cell walls; seal member 104 sealing the cell. Polarizer can act as analyzer.

2. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US6067141A) as applied to claim 2 in view of Hashimoto et al. (EP0768560A1).

Hashimoto discloses in Fig. 15 that hybrid nematic mode has been used in LCD device for high response speed of liquid crystal layer.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal device as Yamada disclosed with the inner surface of the second cell wall treated to produce a locally homeotropic alignment of liquid crystal material, whereby the cell function in a hybrid nematic mode for high-speed response.

3. Claims 8-11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US6067141A) as applied to claim 1, and in view of Hirata et al. (US5872611A).

Hirata discloses in Figs. 7, 11, 13, 14 that the features comprise posts which are tilted with respect to the normal with respect to the normal the plane of first cell wall; and the features are at least one of different height, different shape, different tilted and different orientation region of device for good view angle characteristic free from inversion phenomenon obtained when view from any direction (column 10, lines 44-46).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal device as Yamada disclosed with posts tilted with respect to the normal with respect to the normal the plane of first cell wall to manipulating alignment of liquid crystal material; and with at least one of different height, different shape, different tilted and different orientation region of device for good view angle characteristic.

4. Claims 13, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US6067141A) as applied to claims 2 and 12, and in view of Enichen (US5552611) and Foushaar et al. (US6236445B1)

Foushaar discloses in Figs. 1-3 that a method of manufacturing of cell comprises (a) applying a plastic material (column 8, lines 65-68, here stated as sublayer) to surface to the surface of a wall; (b) applying a photoresist material to a surface of wall, exposing the applied photoresist material to suitable light source through a mask, removing unexposed photoresist, and hardening the exposed photoresist material (column 2, lines 27-33). However, Foushaar fails to disclose mask with random two-dimension array pattern.

Enichen discloses mask with pseudo-random two-dimension array pattern (column 4, lines 9-10 or 31-38) that can be used to produce random posts with different sizes and shapes.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal device as Yamada disclosed with a manufacturing method of cell wall, which comprises applying a plastic material to surface to the surface of a wall for less cost in material and manufacture; (b) applying a photoresist material to a surface of wall, exposing the applied photoresist material to suitable light source through a mask which has random two dimension array pattern, removing unexposed photoresist, and hardening the exposed photoresist material for producing a random two dimensional array of alignment feature on the wall.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US6067141A) as applied to claim 2, and in view of Wakita et al (US5574593A)

Wakita et al. disclose in Fig. 1 that the inner surface of the second cell wall is treated to produce a locally alignment of liquid crystal material, whereby the cell function in a STN mode 7.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal device as Yamada et al. disclosed with that the inner surface of the second cell wall treated to produce a

locally alignment of liquid crystal material, whereby the cell function in a STN mode for high brightness and contrast.

### ***Response to Arguments***

Applicant's arguments filed on April 12, 2002 have been fully considered but they are not persuasive.

#### Applicant's ONLY arguments are follows:

- a. Yamada et al. fail to disclose surface alignment structure on inner surface of at least the first cell wall providing a desired alignment to molecules of the liquid crystal material, wherein surface alignment structure comprises one of a random two dimensional array (Fig. 12B) of upstanding features, which are at least one of shaped and orientated to produce the desired alignment.
- b. Hirata et al. fail for rejection because
  - Bumps do not serve to align the liquid crystals and therefore are not shaped and oriented to produce the desired alignment.
  - Conventional alignment away from Yamada wherein multiple random alignments are employed, so that a combination of references of Yamada and Hirata cannot apply.
- c. Enichen and Foschaar fail to disclose an alignment structure for aligning the director of a liquid crystal material, which including one of a random or pseudorandom two-dimensional array". Enichen does not relate to liquid crystal displays and relate in different technical field.

d. Wakita et al. disclose a liquid crystal element having a laminated retardation film, which does not require a polarizer.

Examiner's responses to Applicants' ONLY arguments are follows:

a. Yamada et al. disclose surface alignment structure with different domains on inner surface of the inner surface of the first cell wall as shown in Figs. 10 and 12B. Nonetheless, wherein surface alignment structure comprises one of a random two-dimensional array (Figs. 10 and 12B) of upstanding features. Applicants also admit the multiple random alignments are employed in Yamada et al. (page 8 paragraph 3 line 10.)

b. Bumps, on which the alignment layer is formed, can serve to align the liquid crystal and therefore bumps can be shaped and oriented to produce the desired alignment. Bumps as Hirata et al disclosed can be shaped as a column structure as Yamada et al. disclose. Bumps obviously can be rearranged to generate totally random domain or "feature." Therefore, Yamada et al. and Hirata et al. represented an analogous art.

c. Since claims 13, 14 and 17 relating to manufacture to liquid crystal display, which generally is also a semiconductor electronic device. Although applicants do not provide the drawing of their technique to manufacture,

applicants also mention (page 20) that the cell wall is manufactured by photomask with array of suitably dimensioned opaque regions (the detail drawings and descriptions are now request to compare with applied references). In specification, applicants also admit of “using conventional lithographic and wet procedures” to manufacture the cell wall. Therefore, Enichen and Fouchaar provide the method to manufacture any type of bump/posts, which generate the alignment structure for aligning the director of a liquid crystal material, which including one of a random or pseudorandom two-dimensional array.

For manufacturing purpose, the Enichen, Fouchaar and Yamada are analogous art since the Enichen and Fouchaar both provide a method to manufacture semiconductor device including liquid crystal display device with lithographic technique. The lithographic technique uses to manufacture the structure in form of bump to make electronic device while structure in form of bump, post or columnar to make liquid crystal display device. Therefore, the lithography is useful technique to make bump, post, projection, groove or columnar for semiconductor device and liquid crystal display device.

d. Polarizer function is to control the light transmission through LCD, thus polarizer can be used as disclosed by Yamada for manipulating the light transmission or brightness although polarizer is not required as disclosed by Wakita et al.

***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (703) 306-0472. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, SIKES L WILLIAM can be reached on (703) 308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-8178 for regular communications and (703) 308-5841 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

HOAN C. NGUYEN  
Examiner  
Art Unit 2871

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June 20, 2002

  
TOAN TON  
PRIMARY EXAMINER